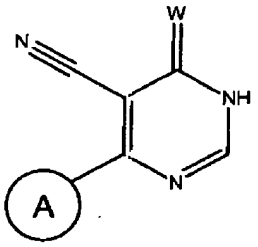
Applicants: Young-Choon Moon
Application No.: 10/799,507

AMENDMENTS TO THE CLAIMS

Please replace all prior versions and listings of claims with the amended claims as follows:

1. (Previously presented) A compound of formula I:



I

or a pharmaceutically acceptable salt thereof, wherein:

W is oxygen or sulfur;

ring A is a 5-6 membered aryl, heterocyclyl or heteroaryl ring having 0-4 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

wherein ring A is optionally substituted with 1-4 groups independently selected from halo; aliphatic, aryl, heteroaryl or heterocyclyl, wherein said aliphatic, aryl, heteroaryl or heterocyclyl is optionally substituted with halo, $-R^2$, $-OR^2$, $-SR^2$, $-NO_2$, $-CN$, $-N(R^2)_2$, $-NR^2C(O)R^2$, $-NR^2C(O)N(R^2)_2$, $-NR^2CO_2R^2$, $-NR^2NR^2C(O)R^2$, $-NR^2NR^2C(O)N(R^2)_2$, $-NR^2NR^2CO_2R^2$, $-C(O)C(O)R^2$, $-C(O)CH_2C(O)R^2$, $-CO_2R^2$, $-C(O)R^2$, $-C(O)N(R^2)_2$, $-OC(O)N(R^2)_2$, $-S(O)_2R^2$, $-SO_2N(R^2)_2$, $-S(O)R^2$, $-NR^2SO_2R^2$, $-NR^2SO_2N(R^2)_2$, $-C(=S)N(R^2)_2$, $-C(=NH)-N(R^2)_2$, $=O$, $=S$, $=NNHR^2$, $=NN(R^2)_2$, $=NNHC(O)R^2$, $=NNHCO_2(R^2)$, $=NNHSO_2(R^2)$, or $=NR^2$, wherein two independent occurrences of R^2, on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^2 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

$-SR^1$, $-NO_2$, $-CN$, $-N(R^1)_2$, $-NR^1C(O)R^1$, $-NR^1C(O)N(R^1)_2$, $-NR^1CO_2R^1$, $-NR^1NR^1C(O)R^1$, $-NR^1NR^1C(O)N(R^1)_2$, $-NR^1NR^1CO_2R^1$, $-C(O)C(O)R^1$, $-C(O)CH_2C(O)R^1$, $-CO_2R^1$, $-C(O)R^1$, $-C(O)N(R^1)_2$, $-OC(O)N(R^1)_2$, $-S(O)_2R^1$, $-SO_2N(R^1)_2$, $-S(O)R^1$, $-NR^1SO_2R^1$, $-NR^1SO_2N(R^1)_2$, $-C(=S)N(R^1)_2$, $-C(=NH)-N(R^1)_2$, $=O$, $=S$, $=NNHR^1$, $=NN(R^1)_2$, $=NNHC(O)R^1$, $=NNHCO_2(R^1)$, $=NNHSO_2(R^1)$, or $=NR^1$, wherein two independent occurrences of R^1, on the

same substituent or different substituents, optionally taken together with the atom or atoms to which each R^1 group is bound, form a 3-8 membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

each R^1 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^1 except hydrogen is optionally substituted with halo, $-R^2$, $-OR^2$, $-SR^2$, $-NO_2$, $-CN$, $-N(R^2)_2$, $-NR^2C(O)R^2$, $-NR^2C(O)N(R^2)_2$, $-NR^2CO_2R^2$, $-NR^2NR^2C(O)R^2$, $-NR^2NR^2C(O)N(R^2)_2$, $-NR^2NR^2CO_2R^2$, $-C(O)C(O)R^2$, $-C(O)CH_2C(O)R^2$, $-CO_2R^2$, $-C(O)R^2$, $-C(O)N(R^2)_2$, $-OC(O)N(R^2)_2$, $-S(O)_2R^2$, $-SO_2N(R^2)_2$, $-S(O)R^2$, $-NR^2SO_2R^2$, $-NR^2SO_2N(R^2)_2$, $-C(=S)N(R^2)_2$, $-C(=NH)-N(R^2)_2$, $=O$, $=S$, $=NNHR^2$, $=NN(R^2)_2$, $=NNHC(O)R^2$, $=NNHCO_2(R^2)$, $=NNHSO_2(R^2)$, or $=NR^2$, wherein two independent occurrences of R^2, on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^2 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

each R^2 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^2 except hydrogen is optionally substituted with halo, $-R^3$, $-OR^3$, $-SR^3$, $-NO_2$, $-CN$, $-N(R^3)_2$, $-NR^3C(O)R^3$, $-NR^3C(O)N(R^3)_2$, $-NR^3CO_2R^3$, $-NR^3NR^3C(O)R^3$, $-NR^3NR^3C(O)N(R^3)_2$, $-NR^3NR^3CO_2R^3$, $-C(O)C(O)R^3$, $-C(O)CH_2C(O)R^3$, $-CO_2R^3$, $-C(O)R^3$, $-C(O)N(R^3)_2$, $-OC(O)N(R^3)_2$, $-S(O)_2R^3$, $-SO_2N(R^3)_2$, $-S(O)R^3$, $-NR^3SO_2R^3$, $-NR^3SO_2N(R^3)_2$, $-C(=S)N(R^3)_2$, $-C(=NH)-N(R^3)_2$, $=O$, $=S$, $=NNHR^3$, $=NN(R^3)_2$, $=NNHC(O)R^3$, $=NNHCO_2(R^3)$, $=NNHSO_2(R^3)$, or $=NR^3$; and

each R^3 is independently hydrogen or unsubstituted aliphatic;

provided that when ring A is phenyl, it must be substituted.

2. (Original) The compound of claim 1, wherein W is oxygen.

3. (Original) The compound of claim 1, wherein W is sulfur.

4. (Previously presented) The compound of claim 2 or 3, wherein ring A is phenyl substituted with 1-4 groups independently selected from halo; aliphatic, aryl, heteroaryl or heterocyclyl, wherein said aliphatic, aryl, heteroaryl or heterocyclyl is optionally

substituted with halo, $-R^2$, $-OR^2$, $-SR^2$, $-NO_2$, -CN, $-N(R^2)_2$, $-NR^2C(O)R^2$, $-NR^2C(O)N(R^2)_2$, $-NR^2CO_2R^2$, $-NR^2NR^2C(O)R^2$, $-NR^2NR^2C(O)N(R^2)_2$, $-NR^2NR^2CO_2R^2$, $-C(O)C(O)R^2$, $-C(O)CH_2C(O)R^2$, $-CO_2R^2$, $-C(O)R^2$, $-C(O)N(R^2)_2$, $-OC(O)N(R^2)_2$, $-S(O)_2R^2$, $-SO_2N(R^2)_2$, $-S(O)R^2$, $-NR^2SO_2R^2$, $-NR^2SO_2N(R^2)_2$, $-C(=S)N(R^2)_2$, $-C(=NH)-N(R^2)_2$, =O, =S, $=NNHR^2$, $=NN(R^2)_2$, $=NNHC(O)R^2$, $=NNHCO_2(R^2)$, $=NNHSO_2(R^2)$, or $=NR^2$, wherein two independent occurrences of R^2, on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^2 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur; $-SR^1$, $-NO_2$, -CN, $-N(R^1)_2$, $-NR^1C(O)R^1$, $-NR^1C(O)N(R^1)_2$, $-NR^1CO_2R^1$, $-NR^1NR^1C(O)R^1$, $-NR^1NR^1C(O)N(R^1)_2$, $-NR^1NR^1CO_2R^1$, $-C(O)C(O)R^1$, $-C(O)CH_2C(O)R^1$, $-CO_2R^1$, $-C(O)R^1$, $-C(O)N(R^1)_2$, $-OC(O)N(R^1)_2$, $-S(O)_2R^1$, $-SO_2N(R^1)_2$, $-S(O)R^1$, $-NR^1SO_2R^1$, $-NR^1SO_2N(R^1)_2$, $-C(=S)N(R^1)_2$, or $-C(=NH)-N(R^1)_2$, wherein two independent occurrences of R^1, on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^1 group is bound, form a 5-7-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-2 heteroatoms independently selected from N, O or S.

5. (Previously presented) The compound of claim 4, wherein ring A is phenyl substituted with 1-4 groups independently selected from halo; aliphatic, aryl, heteroaryl or heterocyclyl, wherein said aliphatic, aryl, heteroaryl or heterocyclyl is optionally substituted with halo, $-R^2$, $-OR^2$, $-SR^2$, $-NO_2$, -CN, $-N(R^2)_2$, $-NR^2C(O)R^2$, $-NR^2C(O)N(R^2)_2$, $-NR^2CO_2R^2$, $-NR^2NR^2C(O)R^2$, $-NR^2NR^2C(O)N(R^2)_2$, $-NR^2NR^2CO_2R^2$, $-C(O)C(O)R^2$, $-C(O)CH_2C(O)R^2$, $-CO_2R^2$, $-C(O)R^2$, $-C(O)N(R^2)_2$, $-OC(O)N(R^2)_2$, $-S(O)_2R^2$, $-SO_2N(R^2)_2$, $-S(O)R^2$, $-NR^2SO_2R^2$, $-NR^2SO_2N(R^2)_2$, $-C(=S)N(R^2)_2$, $-C(=NH)-N(R^2)_2$, =O, =S, $=NNHR^2$, $=NN(R^2)_2$, $=NNHC(O)R^2$, $=NNHCO_2(R^2)$, $=NNHSO_2(R^2)$, or $=NR^2$, wherein two independent occurrences of R^2, on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^2 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur; $-SR^1$, $-NO_2$, -CN, $-N(R^1)_2$, $-NR^1C(O)R^1$, $-CO_2R^1$, $-C(O)R^1$, $-C(O)N(R^1)_2$, $-S(O)_2R^1$, $-SO_2N(R^1)_2$, $-NR^1SO_2R^1$, or $-C(=S)N(R^1)_2$, wherein two independent occurrences of R^1, on the same substituent or different substituents, optionally taken together

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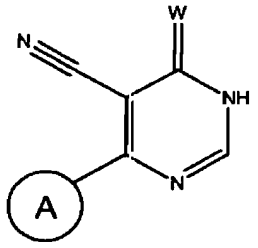
with the atom or atoms to which each R^1 group is bound, form a 5-7-membered heterocyclyl, aryl, or heteroaryl ring having 0-2 heteroatoms independently selected from N, O or S.

6. (Previously presented) The compound of claim 21, wherein ring A is a 5-6 membered heterocyclyl or heteroaryl ring having 1-2 heteroatoms independently selected from N, O or S, wherein ring A is optionally substituted with 1-4 groups independently selected from halo, $-R^1$, $-OR^1$, $-SR^1$, $-NO_2$, -CN, $-N(R^1)_2$, $-NR^1C(O)R^1$, $-CO_2R^1$, $-C(O)R^1$, $-C(O)N(R^1)_2$, $-S(O)_2R^1$, $-SO_2N(R^1)_2$, $-NR^1SO_2R^1$, or $-C(=S)N(R^1)_2$, wherein two independent occurrences of R^1, on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^1 group is bound, form a 5-7-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-2 heteroatoms independently selected from N, O or S.

7. (Previously presented) A compound of formula I:



I

or a pharmaceutically acceptable salt thereof, wherein:

W is oxygen or sulfur;

ring A is naphthyl, benzodioxolyl, dihydrobenzodioxinyl, benzothiazolyl, benzoimidazolyl, or dihydrobenzo[b][1,4]dioxepinyl, wherein each member of ring A is optionally substituted with halo, $-R^2$, $-OR^2$, $-SR^2$, $-NO_2$, -CN, $-N(R^2)_2$, $-NR^2C(O)R^2$, $-CO_2R^2$, $-C(O)R^2$, $-C(O)N(R^2)_2$, $-S(O)_2R^2$, $-SO_2N(R^2)_2$, $-NR^2SO_2R^2$, or $-C(=S)N(R^2)_2$;

each R^2 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^2 except hydrogen is optionally substituted with halo, $-R^3$, $-OR^3$, $-SR^3$, $-NO_2$, -CN, $-N(R^3)_2$, $-NR^3C(O)R^3$, $-NR^3C(O)N(R^3)_2$, $-NR^3CO_2R^3$, $-NR^3NR^3C(O)R^3$, $-NR^3NR^3C(O)N(R^3)_2$, $-NR^3NR^3CO_2R^3$, $-C(O)C(O)R^3$, $-C(O)CH_2C(O)R^3$, $-CO_2R^3$, $-C(O)R^3$, $-C(O)N(R^3)_2$, $-OC(O)N(R^3)_2$, $-S(O)_2R^3$, $-SO_2N(R^3)_2$, $-S(O)R^3$, $-NR^3SO_2R^3$,

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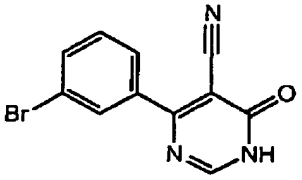
$-NR^3SO_2N(R^3)_2$, $-C(=S)N(R^3)_2$, $-C(=NH)-N(R^3)_2$, =O, =S, $=NNHR^3$, $=NN(R^3)_2$, $=NNHC(O)R^3$, $=NNHCO_2(R^3)$, $=NNHSO_2(R^3)$, or $=NR^3$; and

each R^3 is independently hydrogen or unsubstituted aliphatic.

8. (Previously presented) The compound of claim 21, wherein ring A is pyridinonyl, tetrahydro-quinolinyl, pyridyl, or thiazolyl, wherein each member of ring A is optionally substituted with halo, $-R^2$, $-OR^2$, $-SR^2$, $-NO_2$, -CN, $-N(R^2)_2$, $-NR^2C(O)R^2$, $-CO_2R^2$, $-C(O)R^2$, $-C(O)N(R^2)_2$, $-S(O)_2R^2$, $-SO_2N(R^2)_2$, $-NR^2SO_2R^2$, or $-C(=S)N(R^2)_2$.

9. (Previously presented) A compound selected from:



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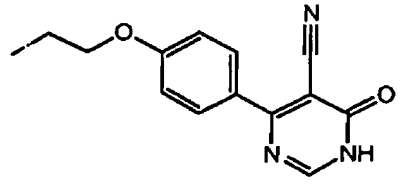

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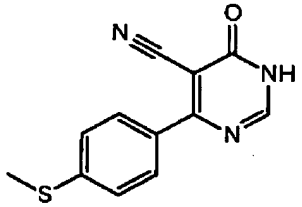

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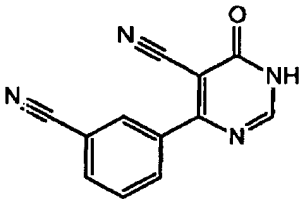

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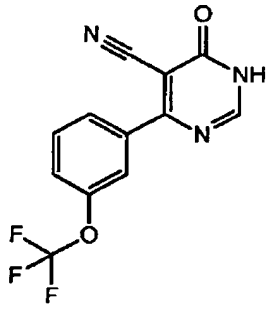

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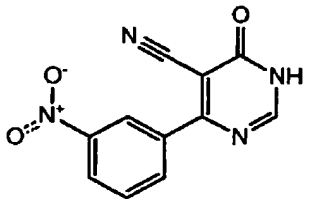

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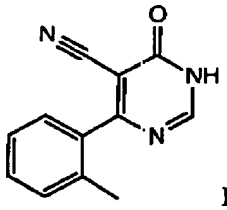

I-10

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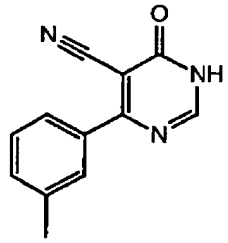

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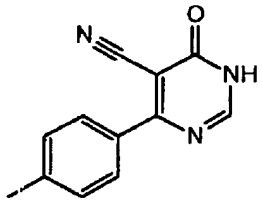

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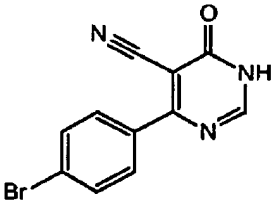

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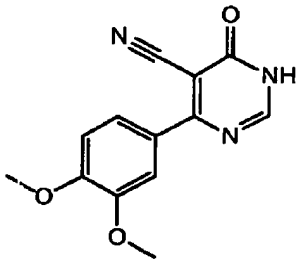

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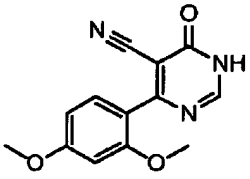

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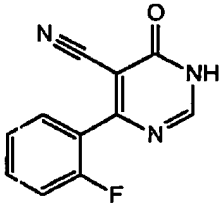

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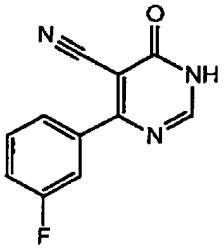

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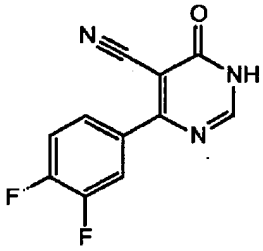

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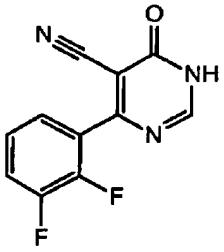

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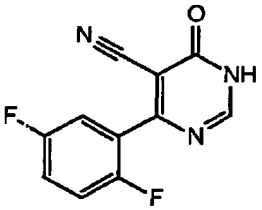

I-20

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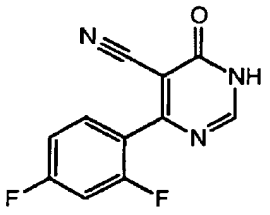

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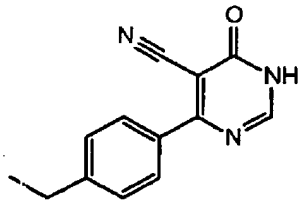

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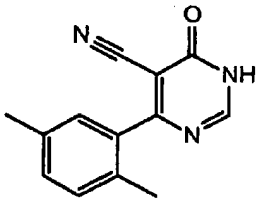

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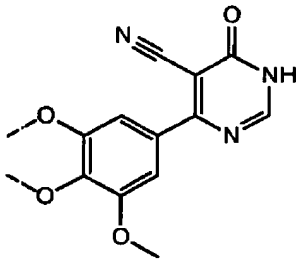

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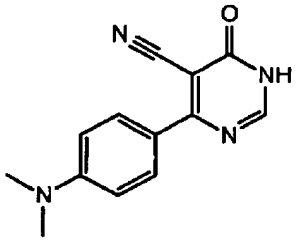

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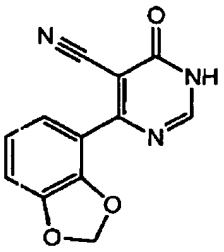

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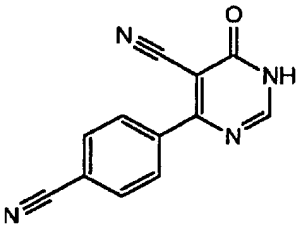

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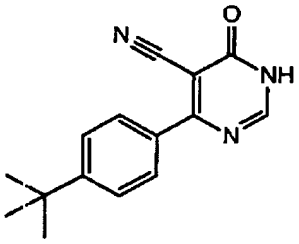
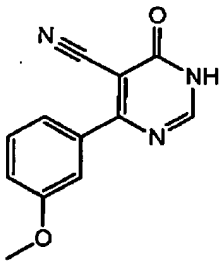


I-28



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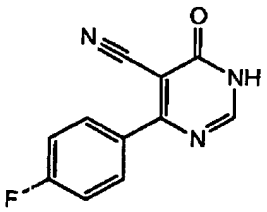

I-30

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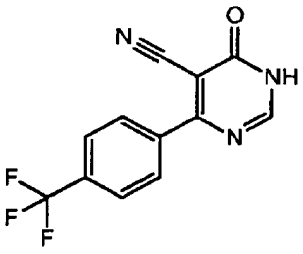

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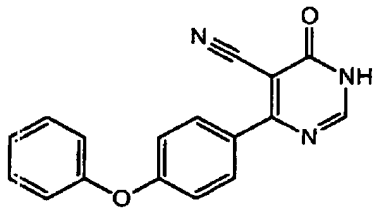

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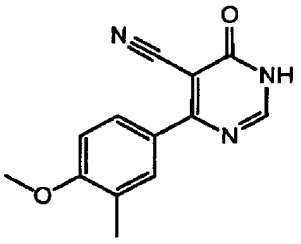

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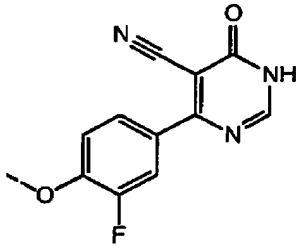

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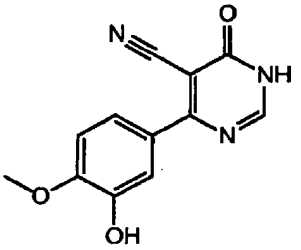

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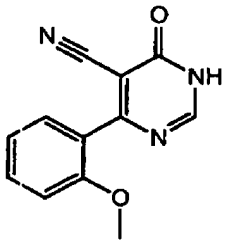

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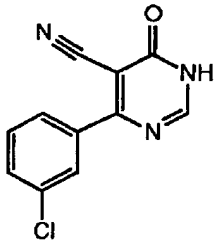

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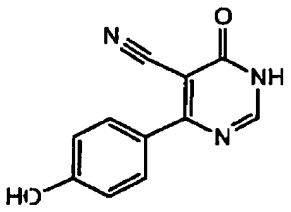

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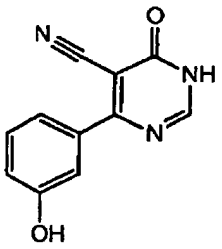

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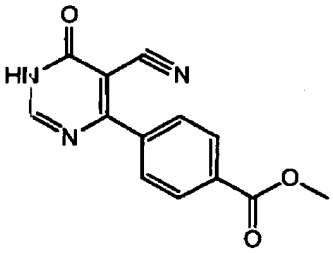

I-40

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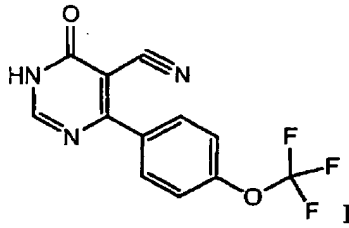
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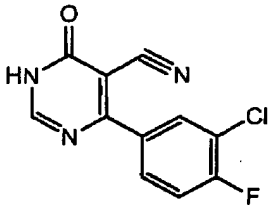
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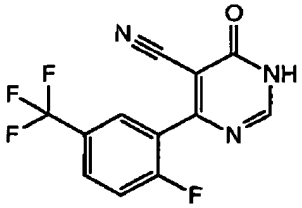
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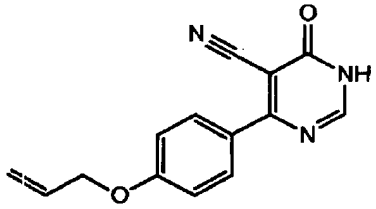
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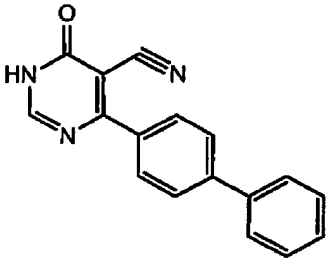
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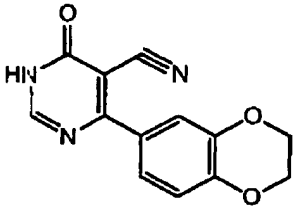
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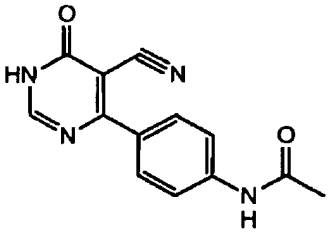
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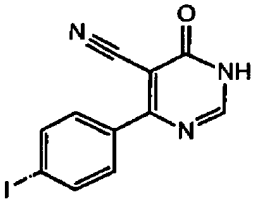
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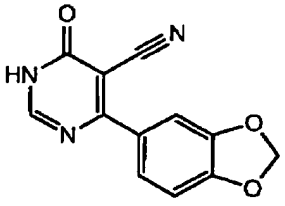
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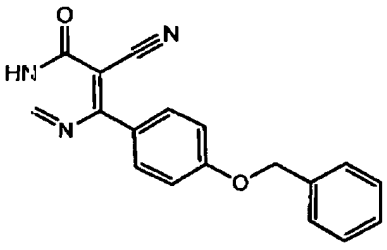
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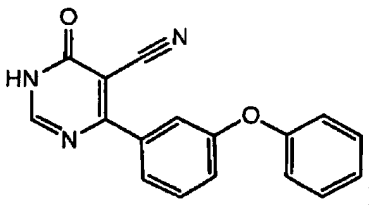
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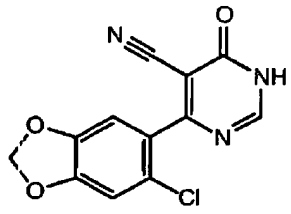
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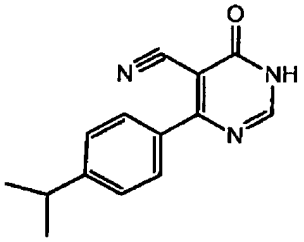
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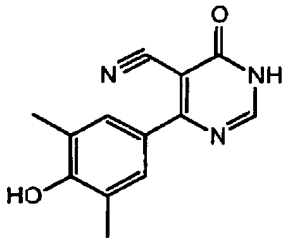
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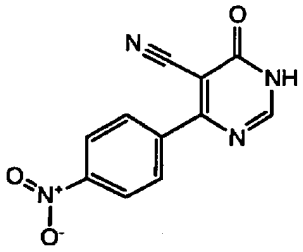
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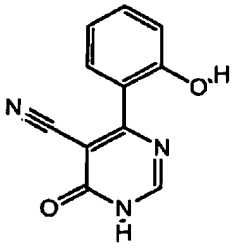
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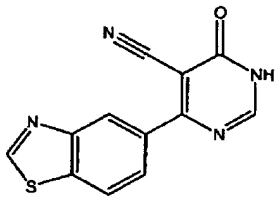
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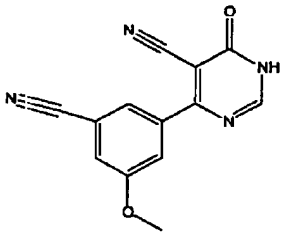
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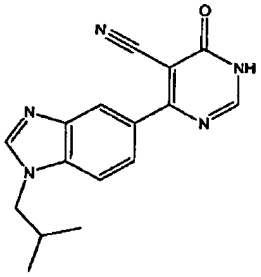
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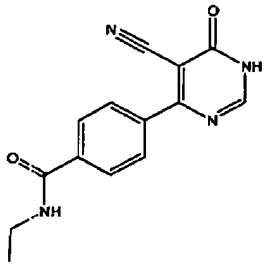
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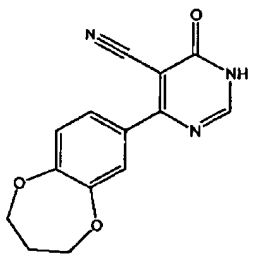

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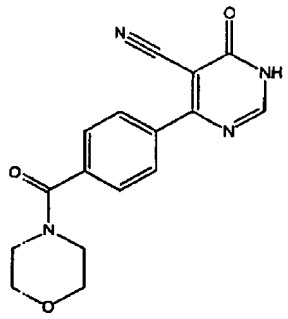

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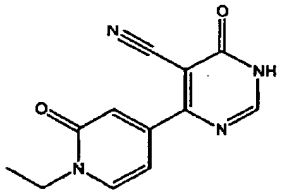

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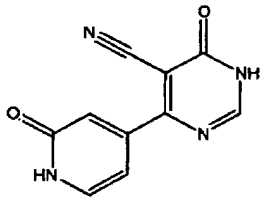

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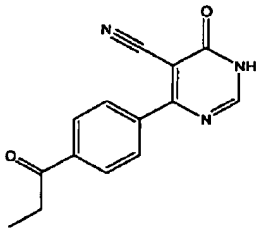

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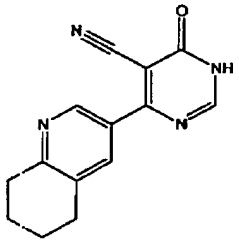

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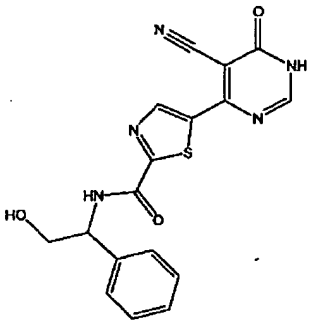

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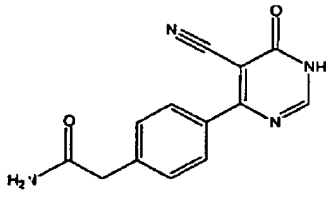

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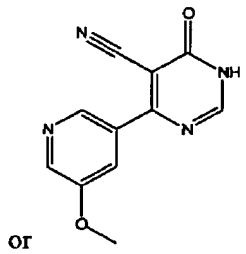

or **I-69.**

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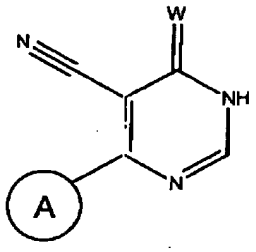
10. (Previously presented) A composition comprising a compound of claim 1, 7, 9, 21 or 22, and a pharmaceutically acceptable carrier, adjuvant, or vehicle.

11. (Previously presented) The composition of claim 10, additionally comprising an agent for treating diabetes.

12. (Currently amended) A method of inhibiting GSK-3 activity in:

an ex vivo biological sample;

which method comprises contacting said biological sample with a compound of formula I:



I

or a pharmaceutically acceptable salt thereof, wherein:

W is oxygen or sulfur;

ring A is a 5-6 membered aryl, heterocyclyl or heteroaryl ring having 0-4 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

wherein ring A is optionally substituted with 1-4 groups independently selected from halo, $-R^1$, $-OR^1$, $-SR^1$, $-NO_2$, -CN, $-N(R^1)_2$, $-NR^1C(O)R^1$, $-NR^1C(O)N(R^1)_2$, $-NR^1CO_2R^1$, $-NR^1NR^1C(O)R^1$, $-NR^1NR^1C(O)N(R^1)_2$, $-NR^1NR^1CO_2R^1$, $-C(O)C(O)R^1$, $-C(O)CH_2C(O)R^1$, $-CO_2R^1$, $-C(O)R^1$, $-C(O)N(R^1)_2$, $-OC(O)N(R^1)_2$, $-S(O)_2R^1$, $-SO_2N(R^1)_2$, $-S(O)R^1$, $-NR^1SO_2R^1$, $-NR^1SO_2N(R^1)_2$, $-C(=S)N(R^1)_2$, $-C(=NH)-N(R^1)_2$, =O, =S, $=NNHR^1$, $=NN(R^1)_2$, $=NNHC(O)R^1$, $=NNHCO_2(R^1)$, $=NNHSO_2(R^1)$, or $=NR^1$, wherein two independent occurrences of R^1, on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^1 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

each R^1 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^1 except hydrogen is optionally substituted with halo,

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$-R^2$, $-OR^2$, $-SR^2$, $-NO_2$, -CN, $-N(R^2)_2$, $-NR^2C(O)R^2$, $-NR^2C(O)N(R^2)_2$, $-NR^2CO_2R^2$, $-NR^2NR^2C(O)R^2$, $-NR^2NR^2C(O)N(R^2)_2$, $-NR^2NR^2CO_2R^2$, $-C(O)C(O)R^2$, $-C(O)CH_2C(O)R^2$, $-CO_2R^2$, $-C(O)R^2$, $-C(O)N(R^2)_2$, $-OC(O)N(R^2)_2$, $-S(O)_2R^2$, $-SO_2N(R^2)_2$, $-S(O)R^2$, $-NR^2SO_2R^2$, $-NR^2SO_2N(R^2)_2$, $-C(=S)N(R^2)_2$, $-C(=NH)-N(R^2)_2$, =O, =S, $=NNHR^2$, $=NN(R^2)_2$, $=NNHC(O)R^2$, $=NNHCO_2(R^2)$, $=NNHSO_2(R^2)$, or $=NR^2$, wherein two independent occurrences of R^2, on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^2 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

each R^2 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^2 except hydrogen is optionally substituted with halo, $-R^3$, $-OR^3$, $-SR^3$, $-NO_2$, -CN, $-N(R^3)_2$, $-NR^3C(O)R^3$, $-NR^3C(O)N(R^3)_2$, $-NR^3CO_2R^3$, $-NR^3NR^3C(O)R^3$, $-NR^3NR^3C(O)N(R^3)_2$, $-NR^3NR^3CO_2R^3$, $-C(O)C(O)R^3$, $-C(O)CH_2C(O)R^3$, $-CO_2R^3$, $-C(O)R^3$, $-C(O)N(R^3)_2$, $-OC(O)N(R^3)_2$, $-S(O)_2R^3$, $-SO_2N(R^3)_2$, $-S(O)R^3$, $-NR^3SO_2R^3$, $-NR^3SO_2N(R^3)_2$, $-C(=S)N(R^3)_2$, $-C(=NH)-N(R^3)_2$, =O, =S, $=NNHR^3$, $=NN(R^3)_2$, $=NNHC(O)R^3$, $=NNHCO_2(R^3)$, $=NNHSO_2(R^3)$, or $=NR^3$; and

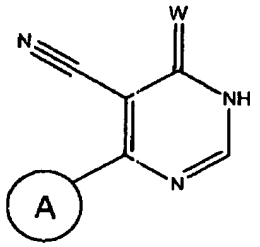
each R^3 is independently hydrogen or unsubstituted aliphatic; or

a pharmaceutical composition comprising said compound and a pharmaceutically acceptable carrier, adjuvant, or vehicle;

in an amount effective to inhibit GSK-3 activity.

13 to 16. (Canceled).

17. (Currently amended) A method of treating or lessening the severity of diabetes in a patient, comprising administering to a said patient a compound of formula I:



I

or a pharmaceutically acceptable salt thereof, wherein:

W is oxygen or sulfur;

ring A is a 5-6 membered aryl, heterocyclyl or heteroaryl ring having 0-4 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

wherein ring A is optionally substituted with 1-4 groups independently selected from halo, $-R^1$, $-OR^1$, $-SR^1$, $-NO_2$, -CN, $-N(R^1)_2$, $-NR^1C(O)R^1$, $-NR^1C(O)N(R^1)_2$, $-NR^1CO_2R^1$, $-NR^1NR^1C(O)R^1$, $-NR^1NR^1C(O)N(R^1)_2$, $-NR^1NR^1CO_2R^1$, $-C(O)C(O)R^1$, $-C(O)CH_2C(O)R^1$, $-CO_2R^1$, $-C(O)R^1$, $-C(O)N(R^1)_2$, $-OC(O)N(R^1)_2$, $-S(O)_2R^1$, $-SO_2N(R^1)_2$, $-S(O)R^1$, $-NR^1SO_2R^1$, $-NR^1SO_2N(R^1)_2$, $-C(=S)N(R^1)_2$, $-C(=NH)-N(R^1)_2$, =O, =S, $=NNHR^1$, $=NN(R^1)_2$, $=NNHC(O)R^1$, $=NNHCO_2(R^1)$, $=NNHSO_2(R^1)$, or $=NR^1$, wherein two independent occurrences of R^1, on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^1 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

each R^1 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^1 except hydrogen is optionally substituted with halo, $-R^2$, $-OR^2$, $-SR^2$, $-NO_2$, -CN, $-N(R^2)_2$, $-NR^2C(O)R^2$, $-NR^2C(O)N(R^2)_2$, $-NR^2CO_2R^2$, $-NR^2NR^2C(O)R^2$, $-NR^2NR^2C(O)N(R^2)_2$, $-NR^2NR^2CO_2R^2$, $-C(O)C(O)R^2$, $-C(O)CH_2C(O)R^2$, $-CO_2R^2$, $-C(O)R^2$, $-C(O)N(R^2)_2$, $-OC(O)N(R^2)_2$, $-S(O)_2R^2$, $-SO_2N(R^2)_2$, $-S(O)R^2$, $-NR^2SO_2R^2$, $-NR^2SO_2N(R^2)_2$, $-C(=S)N(R^2)_2$, $-C(=NH)-N(R^2)_2$, =O, =S, $=NNHR^2$, $=NN(R^2)_2$, $=NNHC(O)R^2$, $=NNHCO_2(R^2)$, $=NNHSO_2(R^2)$, or $=NR^2$, wherein two independent occurrences of R^2, on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^2 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

each R^2 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^2 except hydrogen is optionally substituted with halo, $-R^3$, $-OR^3$, $-SR^3$, $-NO_2$, -CN, $-N(R^3)_2$, $-NR^3C(O)R^3$, $-NR^3C(O)N(R^3)_2$, $-NR^3CO_2R^3$, $-NR^3NR^3C(O)R^3$, $-NR^3NR^3C(O)N(R^3)_2$, $-NR^3NR^3CO_2R^3$, $-C(O)C(O)R^3$, $-C(O)CH_2C(O)R^3$, $-CO_2R^3$, $-C(O)R^3$, $-C(O)N(R^3)_2$, $-OC(O)N(R^3)_2$, $-S(O)_2R^3$, $-SO_2N(R^3)_2$, $-S(O)R^3$, $-NR^3SO_2R^3$,

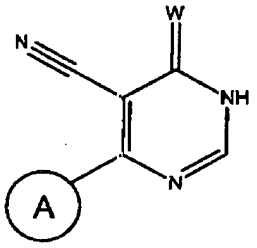
$-NR^3SO_2N(R^3)_2$, $-C(=S)N(R^3)_2$, $-C(=NH)-N(R^3)_2$, =O, =S, $=NNHR^3$, $=NN(R^3)_2$, $=NNHC(O)R^3$, $=NNHCO_2(R^3)$, $=NNHSO_2(R^3)$, or $=NR^3$; and

each R^3 is independently hydrogen or unsubstituted aliphatic; or

a pharmaceutical composition comprising said compound and a pharmaceutically acceptable carrier, adjuvant, or vehicle;

in an amount effective to treat or lessen the severity of ~~said disease or condition~~diabetes in said patient.

18. (Previously presented) A method of treating or lessening the severity of stroke in a patient, comprising administering to said patient a compound of formula I:



I

or a pharmaceutically acceptable salt thereof, wherein:

W is oxygen or sulfur;

ring A is a 5-6 membered aryl, heterocyclyl or heteroaryl ring having 0-4 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

wherein ring A is optionally substituted with 1-4 groups independently selected from halo, $-R^1$, $-OR^1$, $-SR^1$, $-NO_2$, -CN, $-N(R^1)_2$, $-NR^1C(O)R^1$, $-NR^1C(O)N(R^1)_2$, $-NR^1CO_2R^1$, $-NR^1NR^1C(O)R^1$, $-NR^1NR^1C(O)N(R^1)_2$, $-NR^1NR^1CO_2R^1$, $-C(O)C(O)R^1$, $-C(O)CH_2C(O)R^1$, $-CO_2R^1$, $-C(O)R^1$, $-C(O)N(R^1)_2$, $-OC(O)N(R^1)_2$, $-S(O)_2R^1$, $-SO_2N(R^1)_2$, $-S(O)R^1$, $-NR^1SO_2R^1$, $-NR^1SO_2N(R^1)_2$, $-C(=S)N(R^1)_2$, $-C(=NH)-N(R^1)_2$, =O, =S, $=NNHR^1$, $=NN(R^1)_2$, $=NNHC(O)R^1$, $=NNHCO_2(R^1)$, $=NNHSO_2(R^1)$, or $=NR^1$, wherein two independent occurrences of R^1, on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^1 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

each R^1 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^1 except hydrogen is optionally substituted with halo, $-R^2$, $-OR^2$, $-SR^2$, $-NO_2$, -CN, $-N(R^2)_2$, $-NR^2C(O)R^2$, $-NR^2C(O)N(R^2)_2$, $-NR^2CO_2R^2$, $-NR^2NR^2C(O)R^2$, $-NR^2NR^2C(O)N(R^2)_2$, $-NR^2NR^2CO_2R^2$, $-C(O)C(O)R^2$, $-C(O)CH_2C(O)R^2$, $-CO_2R^2$, $-C(O)R^2$, $-C(O)N(R^2)_2$, $-OC(O)N(R^2)_2$, $-S(O)_2R^2$, $-SO_2N(R^2)_2$, $-S(O)R^2$, $-NR^2SO_2R^2$, $-NR^2SO_2N(R^2)_2$, $-C(=S)N(R^2)_2$, $-C(=NH)-N(R^2)_2$, =O, =S, $=NNHR^2$, $=NN(R^2)_2$, $=NNHC(O)R^2$, $=NNHCO_2(R^2)$, $=NNHSO_2(R^2)$, or $=NR^2$, wherein two independent occurrences of R^2, on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^2 group is bound, form a 3-8-membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

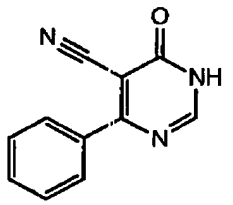
each R^2 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^2 except hydrogen is optionally substituted with halo, $-R^3$, $-OR^3$, $-SR^3$, $-NO_2$, -CN, $-N(R^3)_2$, $-NR^3C(O)R^3$, $-NR^3C(O)N(R^3)_2$, $-NR^3CO_2R^3$, $-NR^3NR^3C(O)R^3$, $-NR^3NR^3C(O)N(R^3)_2$, $-NR^3NR^3CO_2R^3$, $-C(O)C(O)R^3$, $-C(O)CH_2C(O)R^3$, $-CO_2R^3$, $-C(O)R^3$, $-C(O)N(R^3)_2$, $-OC(O)N(R^3)_2$, $-S(O)_2R^3$, $-SO_2N(R^3)_2$, $-S(O)R^3$, $-NR^3SO_2R^3$, $-NR^3SO_2N(R^3)_2$, $-C(=S)N(R^3)_2$, $-C(=NH)-N(R^3)_2$, =O, =S, $=NNHR^3$, $=NN(R^3)_2$, $=NNHC(O)R^3$, $=NNHCO_2(R^3)$, $=NNHSO_2(R^3)$, or $=NR^3$; and

each R^3 is independently hydrogen or unsubstituted aliphatic; or

a pharmaceutical composition comprising said compound and a pharmaceutically acceptable carrier, adjuvant, or vehicle;

in an amount effective to treat or lessen the severity of stroke in said patient.

19. (Currently amended) The method according to ~~either of claims 17 or~~ claim 18, wherein said method comprises administering to said patient compound **I-1**:



I-1

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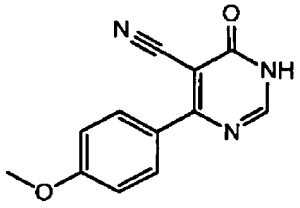
or a compound selected from:



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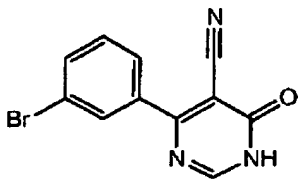

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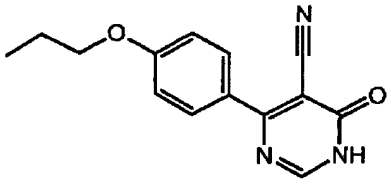

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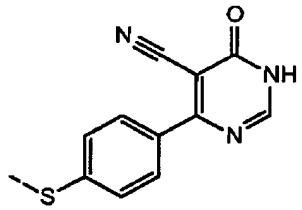

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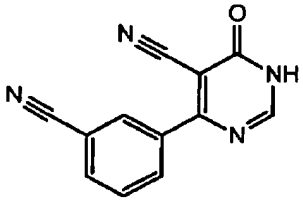

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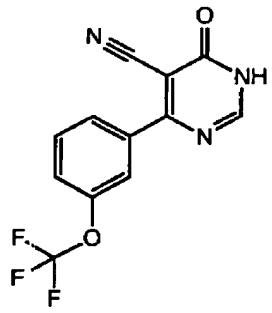

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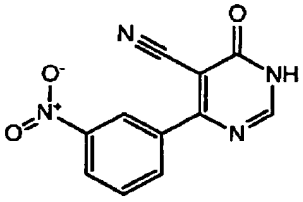

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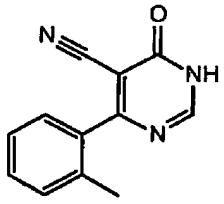

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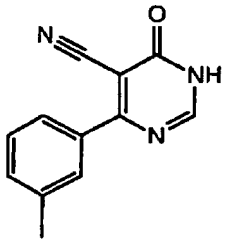

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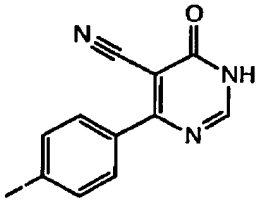

I-12

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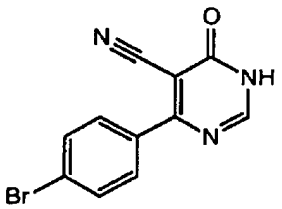

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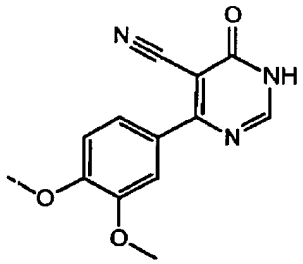

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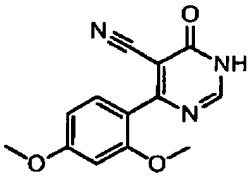

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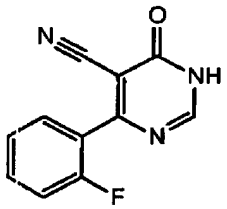

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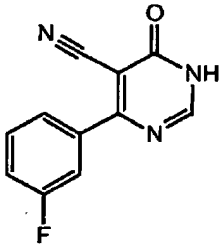

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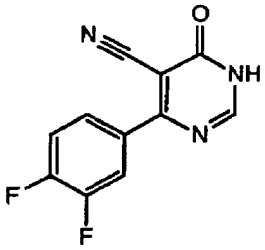

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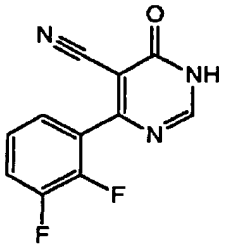

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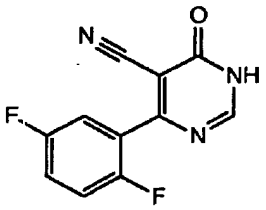

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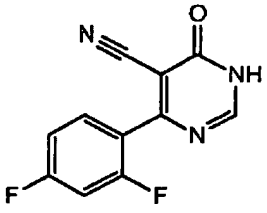

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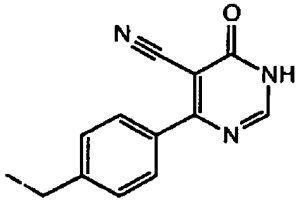

I-22

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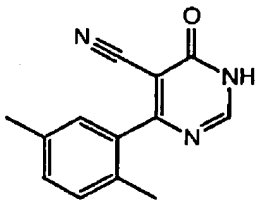

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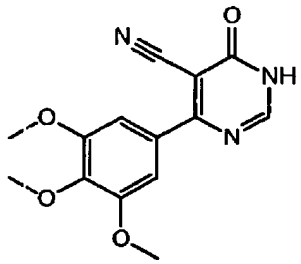

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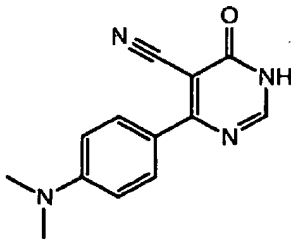

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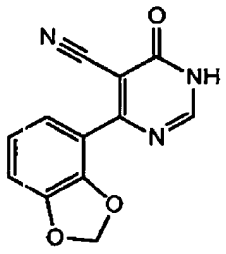

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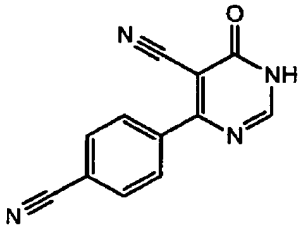

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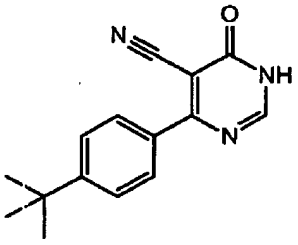

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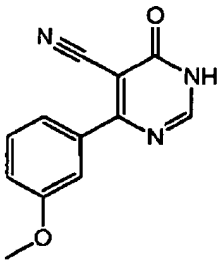

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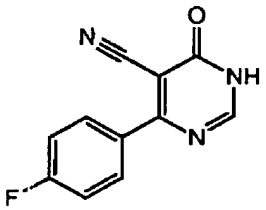

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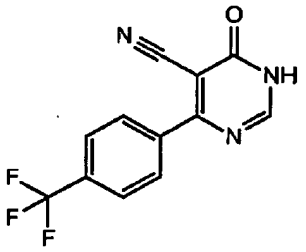

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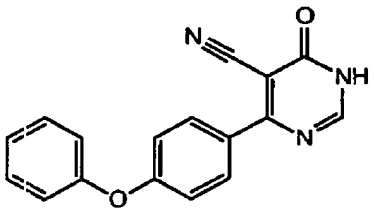

I-32

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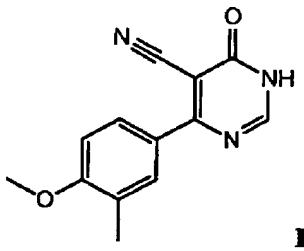

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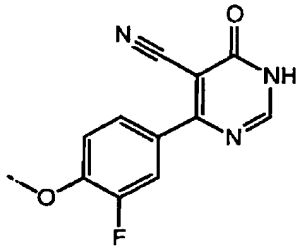

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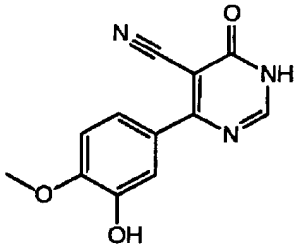

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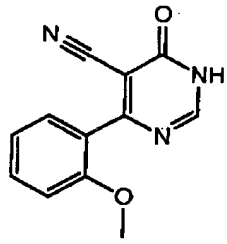

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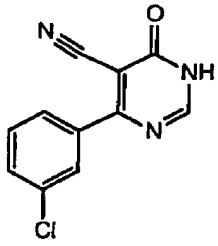

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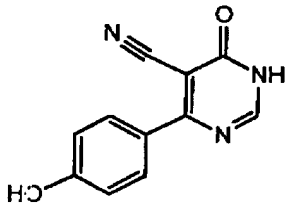

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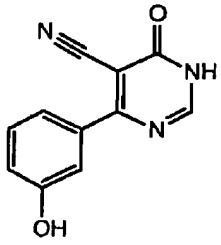

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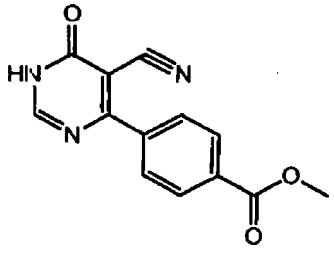

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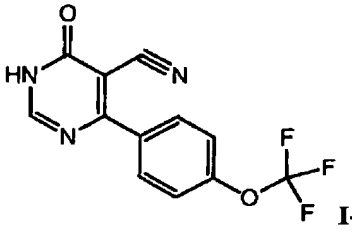

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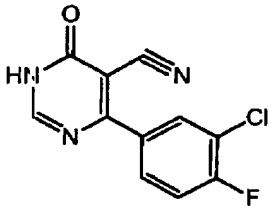

I-42

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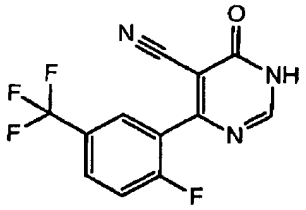
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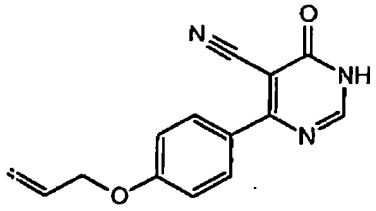
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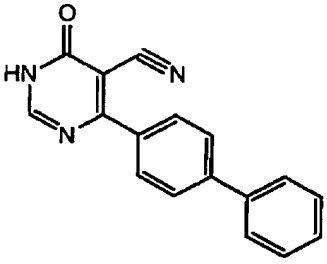
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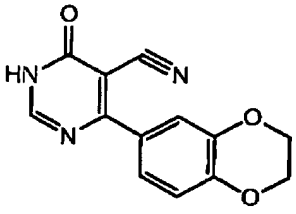
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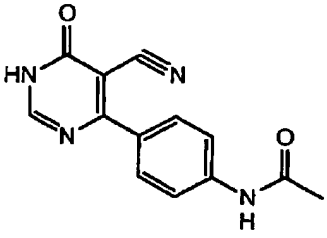
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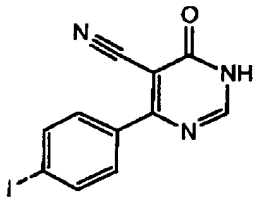
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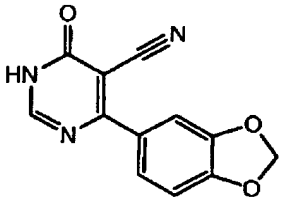
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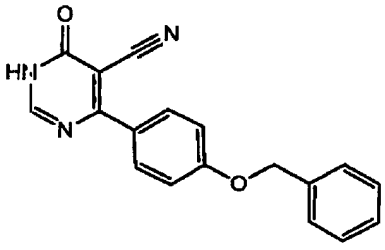
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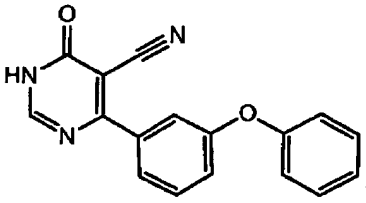
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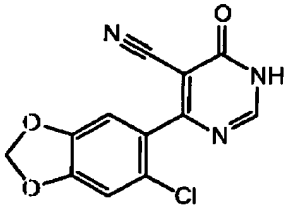
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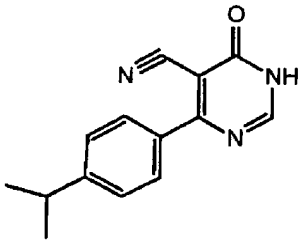

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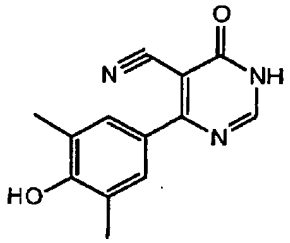

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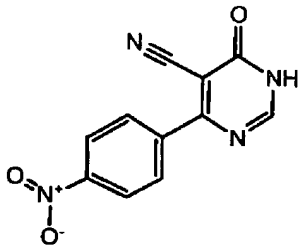

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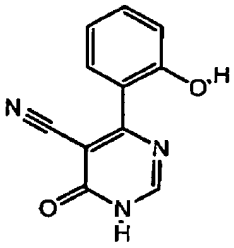

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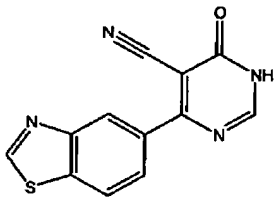

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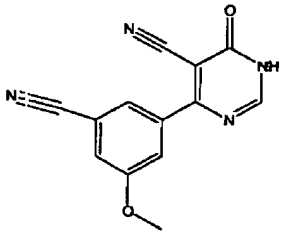

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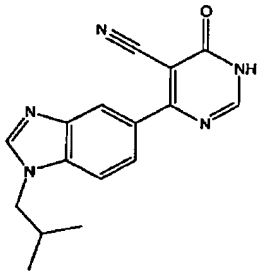

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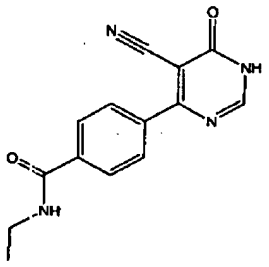

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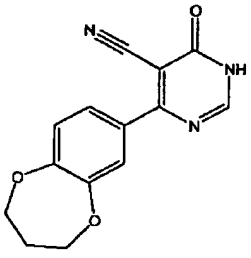

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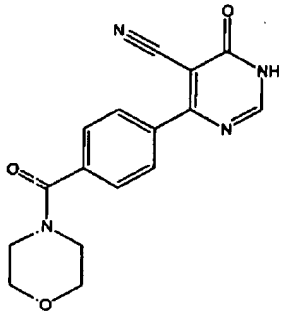

I-62

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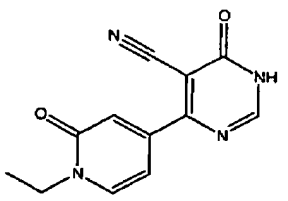

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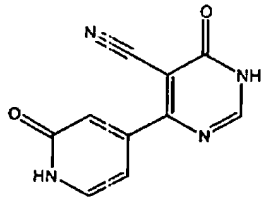

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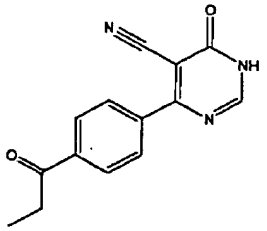

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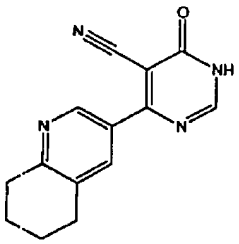

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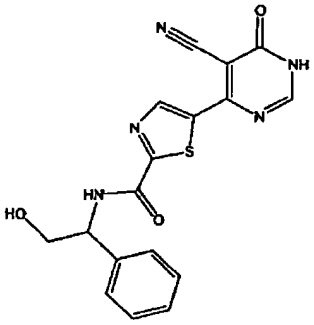

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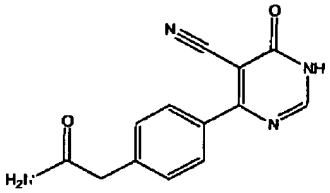
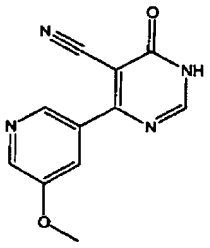


I-68



or I-69 , or

a pharmaceutical composition comprising said compound and a pharmaceutically acceptable carrier, adjuvant, or vehicle.

20. (Currently amended) The method according to ~~either of claims 18 or 19,~~ claim 18, comprising the additional step of administering to said patient an additional therapeutic agent for treating ~~diabetes~~ stroke, wherein:

said additional therapeutic agent is administered together with said composition as a single dosage form or separately from said composition as part of a multiple dosage form.

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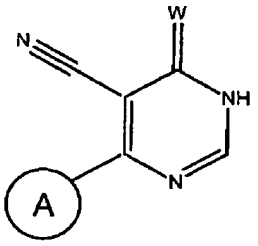
21. (Previously presented) A compound of formula I:



I

or a pharmaceutically acceptable salt thereof, wherein:

W is oxygen or sulfur;

ring A is a 5-6 membered heterocyclyl or heteroaryl ring having 1-4 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

wherein ring A is optionally substituted with 1-4 groups independently selected from halo, $-R^1$, $-OR^1$, $-SR^1$, $-NO_2$, -CN, $-N(R^1)_2$, $-NR^1C(O)R^1$, $-NR^1C(O)N(R^1)_2$, $-NR^1CO_2R^1$, $-NR^1NR^1C(O)R^1$, $-NR^1NR^1C(O)N(R^1)_2$, $-NR^1NR^1CO_2R^1$, $-C(O)C(O)R^1$, $-C(O)CH_2C(O)R^1$, $-CO_2R^1$, $-C(O)R^1$, $-C(O)N(R^1)_2$, $-OC(O)N(R^1)_2$, $-S(O)_2R^1$, $-SO_2N(R^1)_2$, $-S(O)R^1$, $-NR^1SO_2R^1$, $-NR^1SO_2N(R^1)_2$, $-C(=S)N(R^1)_2$, $-C(=NH)-N(R^1)_2$, =O, =S, $=NNHR^1$, $=NN(R^1)_2$, $=NNHC(O)R^1$, $=NNHCO_2(R^1)$, $=NNHSO_2(R^1)$, or $=NR^1$, wherein two independent occurrences of R^1, on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^1 group is bound, form a 3-8 membered cycloalkyl, heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

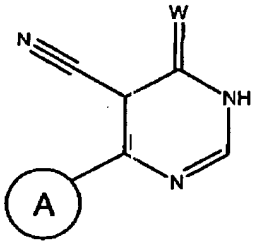
each R^1 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^1 except hydrogen is optionally substituted with halo, $-R^2$, $-OR^2$, $-SR^2$, $-NO_2$, -CN, $-N(R^2)_2$, $-NR^2C(O)R^2$, $-NR^2C(O)N(R^2)_2$, $-NR^2CO_2R^2$, $-NR^2NR^2C(O)R^2$, $-NR^2NR^2C(O)N(R^2)_2$, $-NR^2NR^2CO_2R^2$, $-C(O)C(O)R^2$, $-C(O)CH_2C(O)R^2$, $-CO_2R^2$, $-C(O)R^2$, $-C(O)N(R^2)_2$, $-OC(O)N(R^2)_2$, $-S(O)_2R^2$, $-SO_2N(R^2)_2$, $-S(O)R^2$, $-NR^2SO_2R^2$, $-NR^2SO_2N(R^2)_2$, $-C(=S)N(R^2)_2$, $-C(=NH)-N(R^2)_2$, =O, =S, $=NNHR^2$, $=NN(R^2)_2$, $=NNHC(O)R^2$, $=NNHCO_2(R^2)$, $=NNHSO_2(R^2)$, or $=NR^2$, wherein two independent occurrences of R^2, on the same substituent or different substituents, optionally taken together with the atom or atoms to which each R^2 group is bound, form a 3-8-membered cycloalkyl,

heterocyclyl, aryl, or heteroaryl ring having 0-3 heteroatoms independently selected from nitrogen, oxygen, or sulfur;

each R^2 is independently selected from hydrogen, aliphatic, aryl, heteroaryl or heterocyclyl, wherein each member of R^2 except hydrogen is optionally substituted with halo, $-R^3$, $-OR^3$, $-SR^3$, $-NO_2$, -CN, $-N(R^3)_2$, $-NR^3C(O)R^3$, $-NR^3C(O)N(R^3)_2$, $-NR^3CO_2R^3$, $-NR^3NR^3C(O)R^3$, $-NR^3NR^3C(O)N(R^3)_2$, $-NR^3NR^3CO_2R^3$, $-C(O)C(O)R^3$, $-C(O)CH_2C(O)R^3$, $-CO_2R^3$, $-C(O)R^3$, $-C(O)N(R^3)_2$, $-OC(O)N(R^3)_2$, $-S(O)_2R^3$, $-SO_2N(R^3)_2$, $-S(O)R^3$, $-NR^3SO_2R^3$, $-NR^3SO_2N(R^3)_2$, $-C(=S)N(R^3)_2$, $-C(=NH)-N(R^3)_2$, =O, =S, $=NNHR^3$, $=NN(R^3)_2$, $=NNHC(O)R^3$, $=NNHCO_2(R^3)$, $=NNHSO_2(R^3)$, or $=NR^3$; and

each R^3 is independently hydrogen or unsubstituted aliphatic.

22. (Previously presented) A compound of formula I:

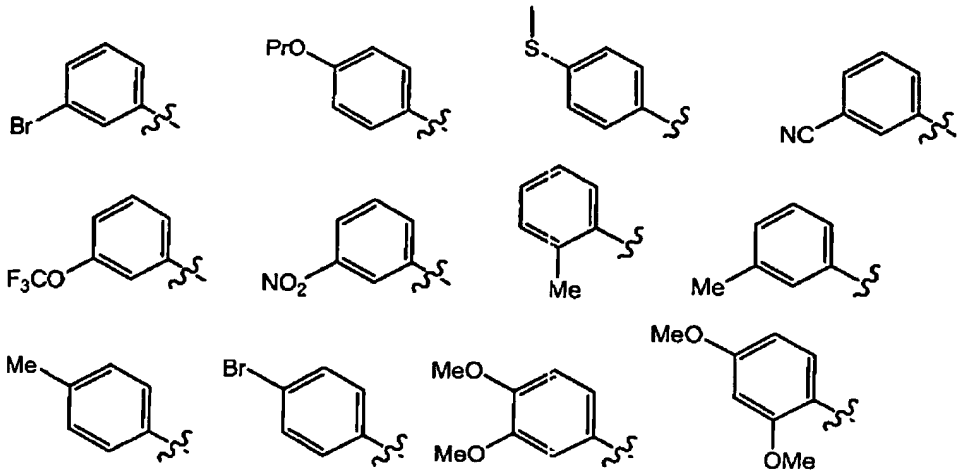


I

or a pharmaceutically acceptable salt thereof, wherein:

W is oxygen or sulfur; and

ring A is selected from:



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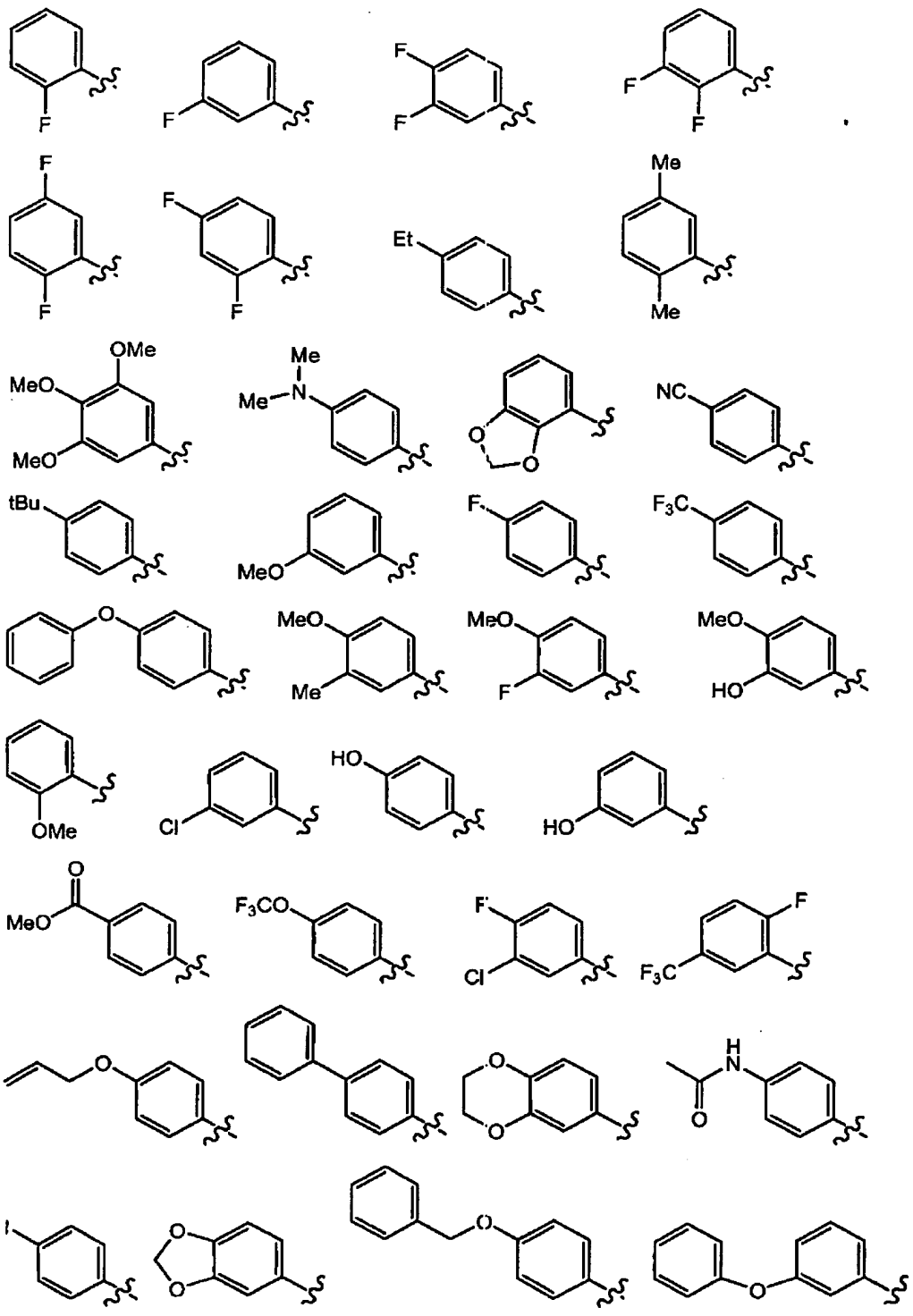

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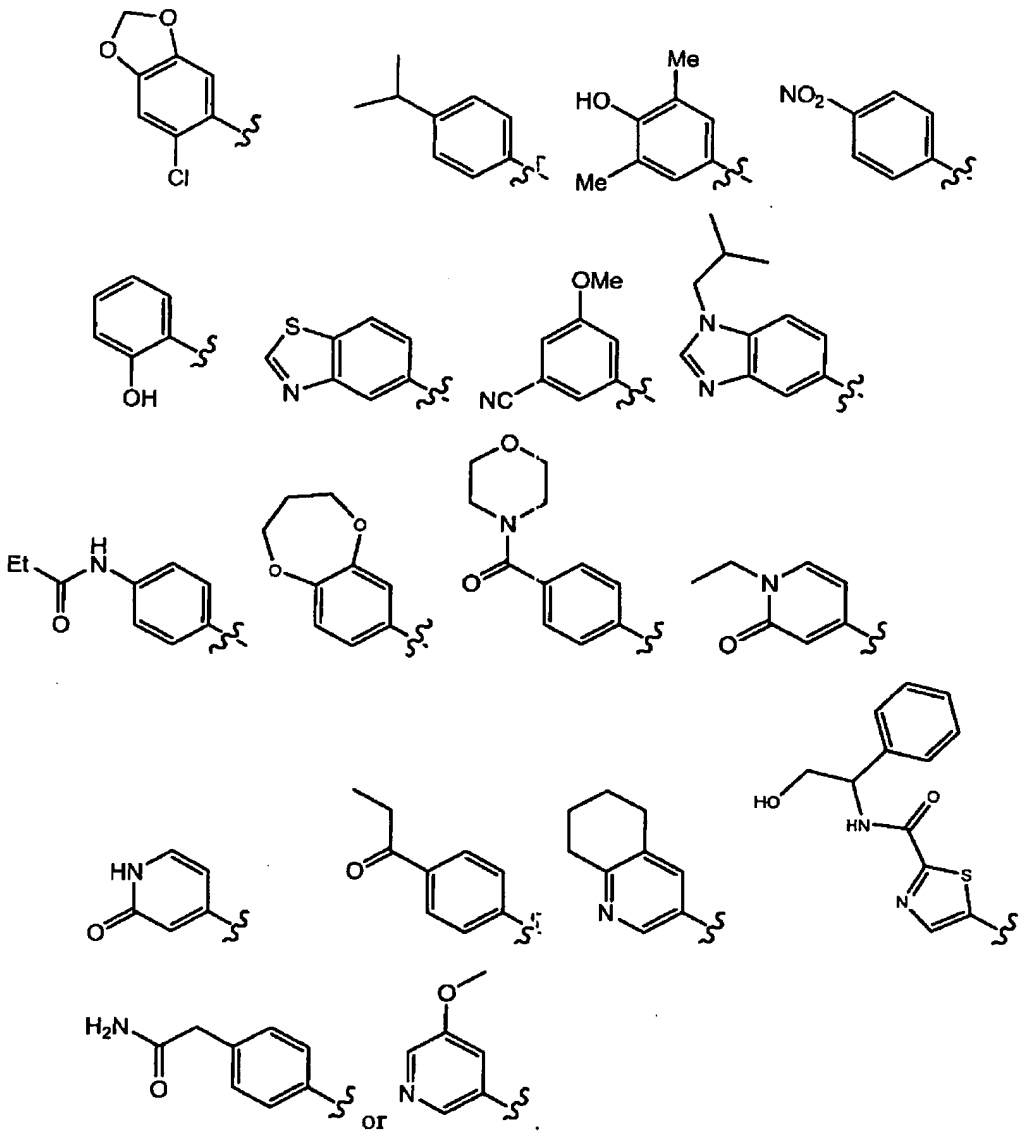

23. (New) The method according to claim 17, wherein said method comprises administering to said patient compound **I-1**:

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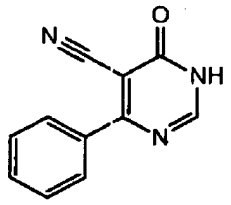
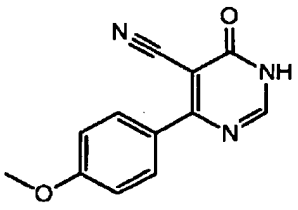
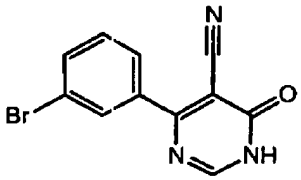


I-1

or a compound selected from:



I-2



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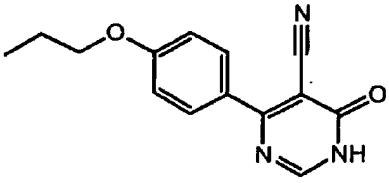
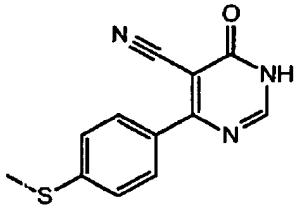
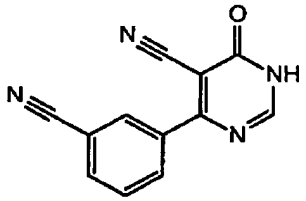


I-4



I-5



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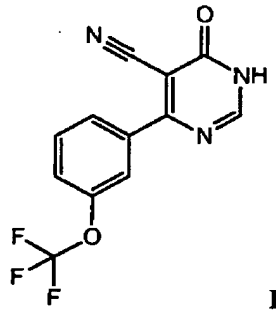
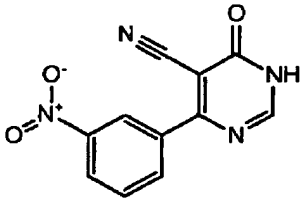
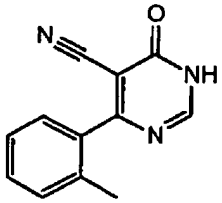


I-7



I-8



I-10

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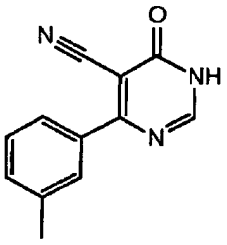
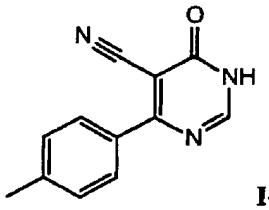


I-11



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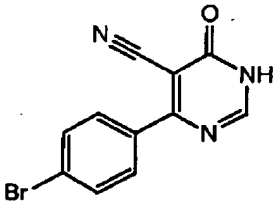

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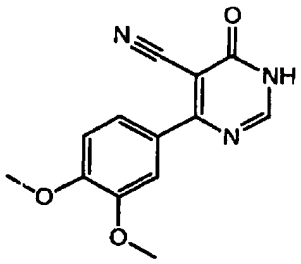

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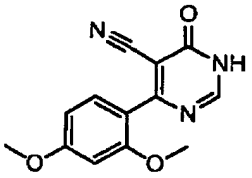

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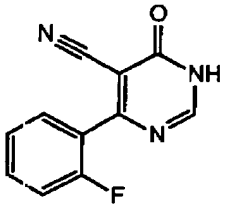

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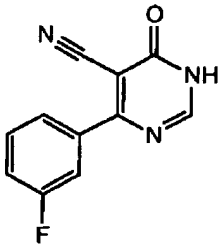

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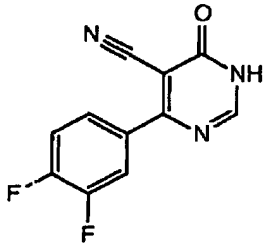

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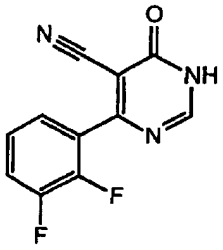

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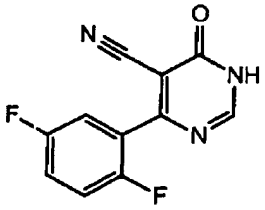

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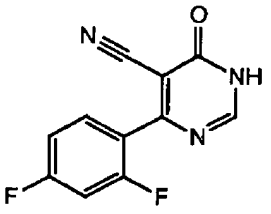

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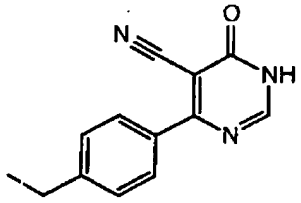

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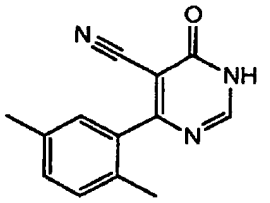

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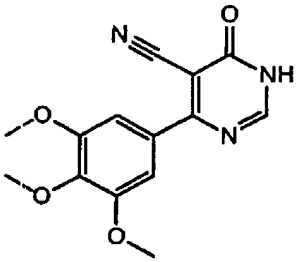

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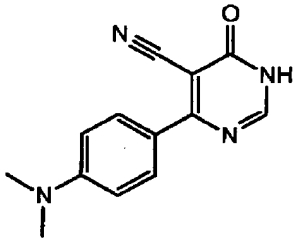

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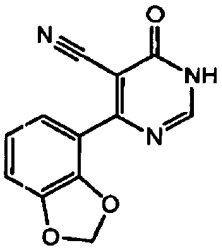

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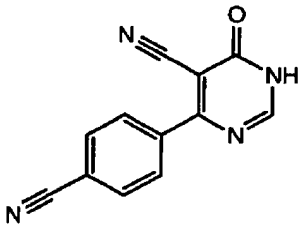

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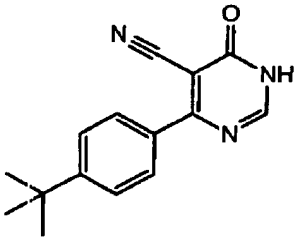

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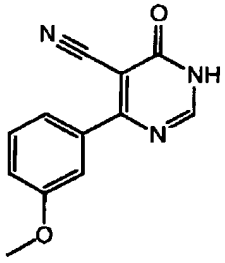

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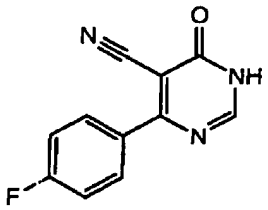

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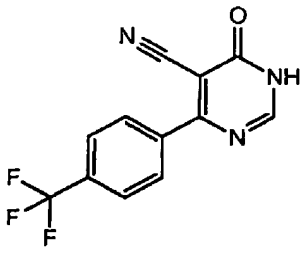

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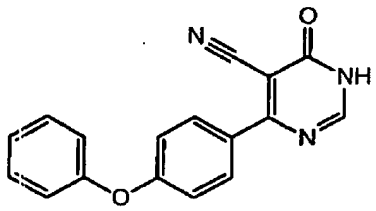

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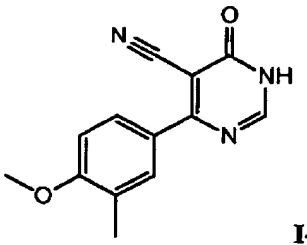

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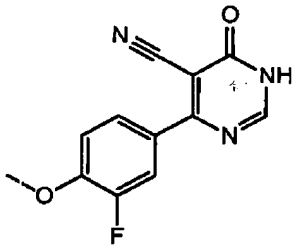

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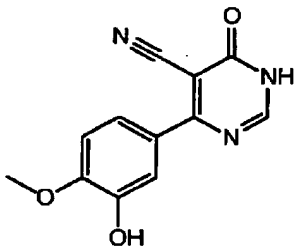

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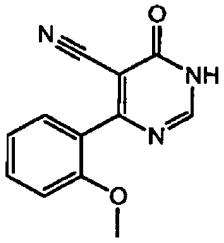

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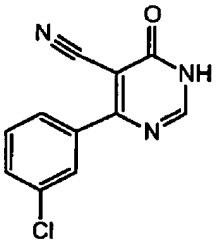

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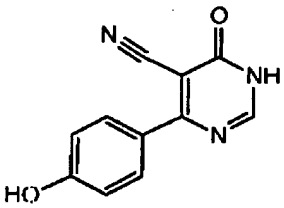

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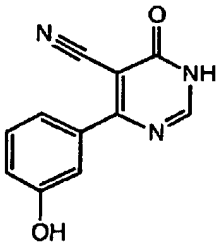

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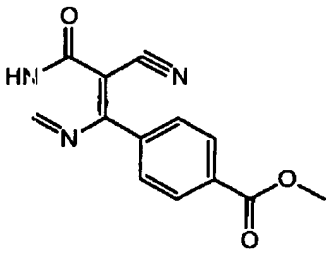

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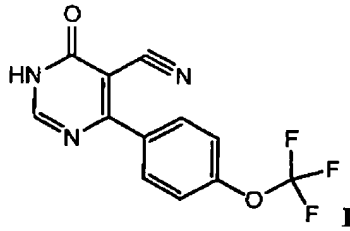
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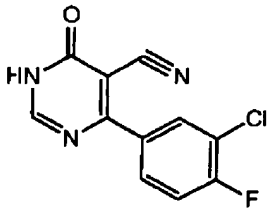
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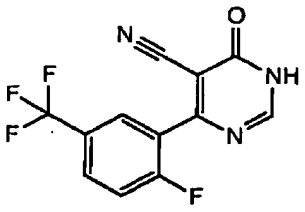
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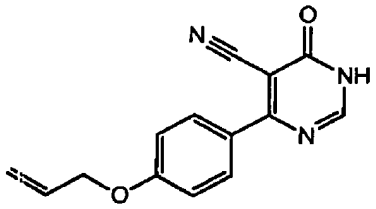
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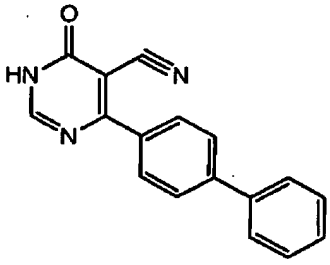
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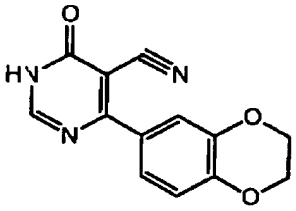
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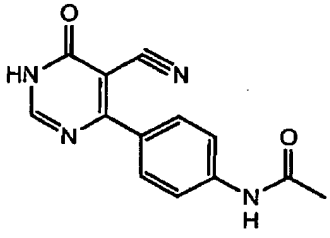
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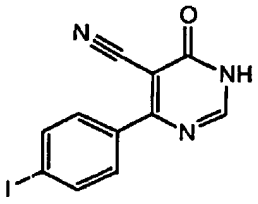
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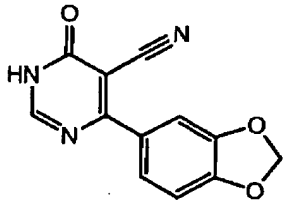
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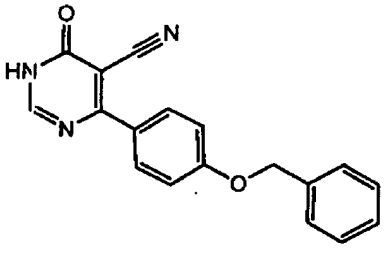
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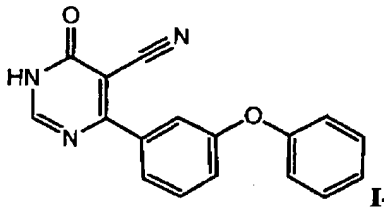

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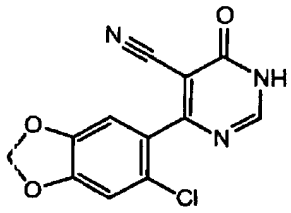

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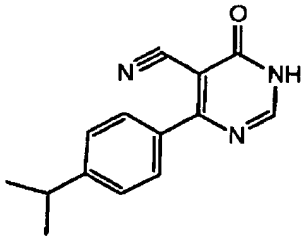

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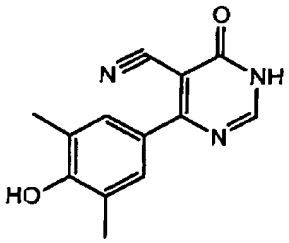

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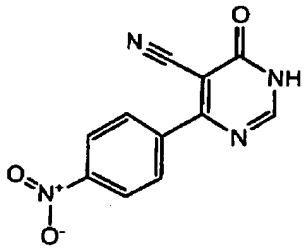

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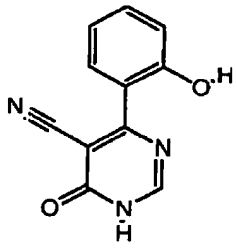

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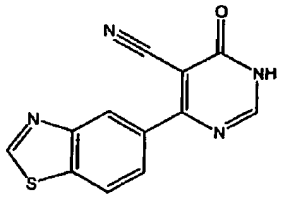

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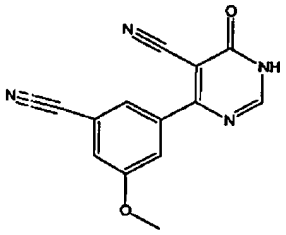

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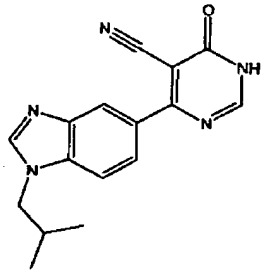

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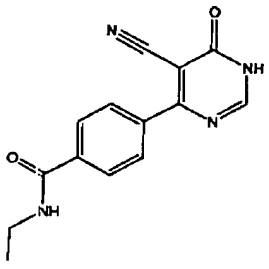

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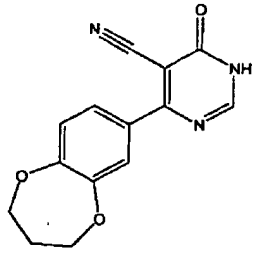

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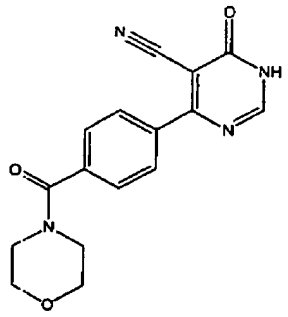

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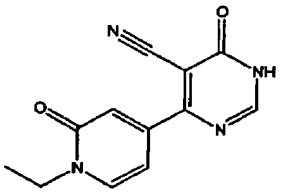

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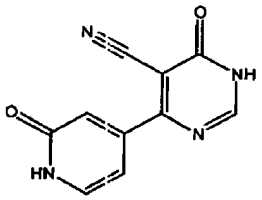

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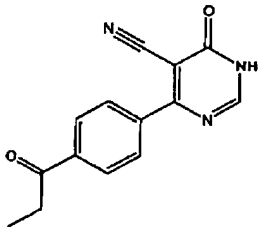

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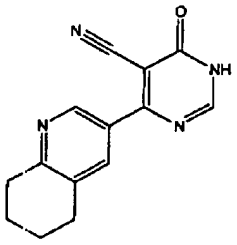

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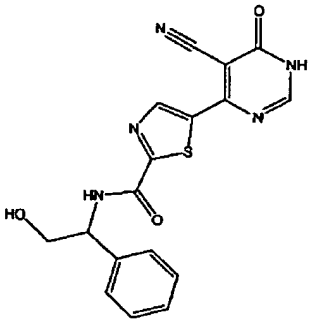

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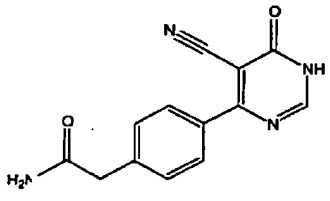

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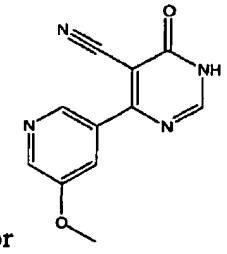

or **I-69** , or

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a pharmaceutical composition comprising said compound and a pharmaceutically acceptable carrier, adjuvant, or vehicle.

24. (New) The method according to claim 23, comprising the additional step of administering to said patient an additional therapeutic agent for treating diabetes, wherein:

said additional therapeutic agent is administered together with said composition as a single dosage form or separately from said composition as part of a multiple dosage form.

25. (New) The method according to claim 17, comprising the additional step of administering to said patient an additional therapeutic agent for treating diabetes, wherein:

said additional therapeutic agent is administered together with said composition as a single dosage form or separately from said composition as part of a multiple dosage form.

26. (New) The method according to claim 19, comprising the additional step of administering to said patient an additional therapeutic agent for treating stroke, wherein:

said additional therapeutic agent is administered together with said composition as a single dosage form or separately from said composition as part of a multiple dosage form.